

# Fort Builders

Fort Point is a brick and granite fortress built between 1853 and 1861. Many workers with different skills had to work together to build the fort.

## Quarriers

The quarriers cut out the granite rocks from the quarry holes in the ground. They cut the large rocks into large, roughly shaped cubes.

## Stonecutters

The stonecutters hammered the large stones into different shapes in a long, covered shed nearby. They constructed the bottom levels and stairs of the fort with these stone blocks.

## Brick makers

The brick makers gathered and mixed the ingredients. Then, they cooked and sorted the bricks in a nearby brickyard.

## Masons

The master masons directed all of the work of the other builders at Fort Point. Rough masons shaped and smoothed the granite stones to the exact measurements set by the master masons. The freemasons carved shape and curves in the stone. The brick masons laid the bricks to build the walls of the fort.

## Apprentices

Several younger workers, called apprentices, studied the work of the masons for many years before they became masons. They helped build Fort Point.

# Life of the Masons

The master mason and a crew of 12 brick makers made more than one million bricks in 1855. About eight million bricks altogether were used to build Fort Point.

Some of the bricks made at Fort Point were sent to construction sites at Fortress Alcatraz.

In 1857, there were 69 masons, 105 workers in the brick yard, 17 stonecutters, and 97 apprentices working at Fort Point.

A master mason earned \$275.00 a month. The other masons could earn about \$73.00 a month.

One-third of the fort builders lived in San Francisco.

An omnibus, a wagon drawn by horses, brought the workers from the city to the fort.

Workers arrived at the fort at 6:00 a.m. and left at 5:00 p.m.

Bricks are made of clay, sand and water. The bricks at Fort Point are red because of the iron in the clay.

The granite used in the foundation of the fort came from Monterey, California. It cost about \$15.00 per ton.

Two thousand tons of granite inside the fort came from China. It had been used as ballast (materials to balance and keep a boat steady) on sailing ships.

The granite used in the spiral staircases came from Folsom, California.

## **Building with Granite**

The roughly shaped granite arrived to the Fort Point Wharf by ship. A wagon took the stone from the wharf, along a wooden plank road (Marine Drive), and to the construction site at the point.

The worker shaped the large rocks into smooth blocks for building the fort. They used hammers, chisels and points to polish the granite. This process is called *bankering up the stone*.

### **Bankering up the stone**

The following process was repeated until each side of the block was polished. After the mater mason inspected the work, the granite was fitted into

place. The finished blocks were used to construct the first floor and the spiral staircases.

1. Draw a straight line along the edge of the stone. Remove the rough edge with a pitching chisel and a hammer.
2. Smooth out the edge with a cutting chisel and a hammer to cut the first draft.
3. Draw another straight line perpendicular to the first draft. Pitch off and draft the second edge.
4. Pitch off and draft the third and fourth edge in the same manner as the first and second. Use a point to smooth the rest of the face.

## Building with Bricks

The original plan stated that the entire fort would be built of granite. Because granite was expensive, the engineers decided to use bricks to build the rest of the fort. Bricks are strong, less expensive, and easy to make.

### Making Bricks

Clay was found in the hillside near the fort. Sand and water were gathered at a nearby beach. These ingredients were used in the following process to make bricks:

1. The first step in brick making is to gather the ingredients. The sand and clay were added together in a mixture of 30 percent sand and 70 percent clay, and then mixed in a machine called a pug-mill. This machine was driven by steam power and sometimes by horses. The mixing of ingredients is called tempering.
2. When the mixture felt like soft mushy mud, workers placed it in a metal or wooden mold. A mold is a model shape for the brick to fit; a lot like a cookie cutter. This was called molding.
3. The bricks were then set aside to dry. When they were dry enough to come out of the mold in one piece, they were stacked inside a kiln. Here, the bricks were placed sideways on their edge with spaces in between them. These spaces let heated air move around and bake the bricks. A kiln was a large oven for cooking the bricks into their hardened form that we see today in the fort.

4. The kiln would heat the bricks to a temperature of about 1,800 degrees F. This heating process was called burning.

A scove kiln, a temporary stove, was built to bake the bricks for Fort Point. The heat in these kilns was not very even. Because of this, all of the bricks did not look the same after the burning. When we bake a batch of cookies in our ovens at home, some of them burn, while others are just right. The same thing happened to bricks - some were better than others after the burning.

The bricks with the best strength, size, and uniform look were called face bricks. These were set aside and used only in places where they would be seen, such as the outer walls and arches. The remaining bricks, called common bricks, were used on the inside of the walls and arches, and in places where plaster covers the walls. These bricks were often discolored and burnt.

### **Brick Patterns**

A brick wall appears to have bricks that are different sizes. Actually, the bricks are the same size. They are arranged in a special way to create a pattern.

The short-looking bricks are called headers, and the long-looking bricks are called stretchers. These stretchers and headers could be combined in many different ways to form walls. These patterns are called bonds.

At Fort Point, Flemish bond and English bond were most widely used. When a stretcher is followed by a header and this pattern continues, it is called Flemish Bond. Flemish bond can be found in most of the walls at Fort Point. When an entire row of headers is followed by a row of stretchers, this is called English bond. English bond can be seen at Fort Point in many of the arches.

### **Laying Bricks**

Once the bricks were baked and sorted, it was time for the bricklayers to begin construction! The brick mason had many tools to make sure the bricks were placed correctly.

1. A trowel was used for spreading mortar and breaking bricks into shapes. Mortar was a mixture of lime and sand and water. It was a type of cement that held the bricks together.
2. A bricklayer's hammer had a hammerhead on one side and a sharp edge on the other for shaping and breaking bricks.
3. A brick-axe was a long piece of metal with a chisel head on both ends for cutting and shaping.
4. The bricklayer's helper used a hod on a long stick to carry bricks and mortar to the bricklayers.

The bricklayers then began to lay the bricks for the walls. The corners of the walls were always built up first, so that lines of string could be stretched between them to guide the bricklayer. It was very important that the bricklayer keep all of the lines equal and level. Therefore, a level, square, plumb-rule, and compass were used to keep the lines equal and evenly spaced.